WHAT IS CLAIMED IS:

1. A data recovery subsystem for use in a receive system configured to receive a magnetic field signal including a carrier component usable for locating an underground object and at least one modulation sideband, the data recovery subsystem comprising:

a first mixer adapted to mix a Radio Frequency (RF) signal representative of the magnetic field signal with a first Local Oscillator (LO) signal to produce an Intermediate Frequency (IF) signal representative of the magnetic field signal, the IF signal including an IF carrier component and an IF modulation sideband;

a Phase Locked Loop (PLL) adapted to phase-lock a second LO signal to the IF carrier component of the IF signal; and

a second mixer adapted to synchronously mix the IF signal with the second LO signal to produce a baseband signal including a demodulated sideband, the demodulated sideband corresponding to the modulation sideband of the magnetic field signal.

2. The subsystem of claim 1, wherein

the PLL includes a Voltage Controlled Oscillator (VCO) adapted to generate a VCO output signal that is phase-locked to the IF carrier component of the IF signal,

the subsystem further comprising a feedback circuit adapted to derive the first LO signal from the VCO output signal, whereby the first LO signal is also phase-locked to the IF carrier component of the IF signal.

3. The subsystem of claim 1, wherein:

the RF signal includes an RF carrier component having an RF carrier frequency substantially equal to an integer multiple of both 50 Hz and 60 Hz; and

the RF signal includes an RF modulation sideband having sideband energy, a substantial portion of the sideband energy being contained between the RF carrier frequency and a frequency spaced 50 Hz from the carrier frequency.

4. The subsystem of claim 1, wherein the PLL includes:

a PLL mixer adapted to derive an error signal representative of a phase difference between the IF carrier component of the IF signal and a feedback signal;

a filter adapted to filter the error signal to thereby produce a filtered error signal;

a Voltage Controlled Oscillator (VCO) adapted to generate a VCO output signal responsive to the filtered error signal; and

a feedback circuit adapted to derive the feedback signal and the second LO signal from the VCO output signal.

5. The subsystem of claim 4, further comprising a second feedback circuit adapted to derive the first LO signal from the VCO output signal, whereby the first LO signal is also phase-locked to the IF carrier component of the IF signal.

6. The subsystem of claim 1, further comprising:

a baseband filter adapted to filter the baseband signal and thereby produce a filtered baseband signal including the demodulated sideband; and

a signal squarer following the baseband filter and adapted to derive a logic signal from the filtered baseband signal, the logic signal being representative of information conveyed by the demodulated sideband.

7. The subsystem of claim 6, further comprising:

a local oscillator for generating a local clock; and

a data synchronizer adapted to

derive a stable re-synchronizing clock from the local clock, and

synchronize the logic signal to the re-synchronizing clock, thereby producing a re-synchronized logic signal having reduced timing jitter relative to the logic signal.

8. The subsystem of claim 7, wherein the demodulated sideband has a -3dB frequency bandwidth defined between a lower sideband frequency and an upper sideband frequency, the lower sideband frequency being frequency-offset from zero Hz and the upper sideband frequency being less than 50 Hz.

9. The subsystem of claim 8, wherein the baseband filter has a bandpass filter characteristic including

a passband bandwidth coinciding with the predetermined bandwidth of the demodulated sideband, and

lower and upper stopband regions to respectively attenuate frequencies at zero and 50 Hz.

10. The subsystem of claim 9, wherein the baseband filter includes a lowpass filter to substantially attenuate frequencies equal to and above 50 Hz.

11. The subsystem of claim 9, wherein the filter includes a 10^{th} order, linear phase, lowpass filter.

12. A method of recovering data from a magnetic field signal, the magnetic field signal including a carrier component usable for locating an underground object and at least one modulation sideband, the method comprising:

(a) mixing a Radio Frequency (RF) signal representative of the magnetic field signal with a first Local Oscillator (LO) signal to produce an Intermediate Frequency (IF) signal representative of the magnetic field signal, the IF signal including an IF carrier component and an IF modulation sideband;

(b) phase-locking a second LO signal to the IF carrier component of the IF signal; and

(c) synchronously mixing the IF signal with the second LO signal to produce a baseband signal including a demodulated sideband, the demodulated sideband corresponding to the modulation sideband of the magnetic field signal.

13. The method of claim 12, further comprising phase-locking the first LO signal to the IF carrier component of the IF signal.

14. The method of claim 12, wherein:

the RF signal includes an RF carrier component having an RF carrier frequency substantially equal to an integer multiple of both 50 Hz and 60 Hz; and

the RF signal includes an RF modulation sideband having sideband energy, a substantial portion of the sideband energy being contained between the RF carrier frequency and a frequency spaced 50 Hz from the carrier frequency.

15. The method of claim 12, wherein step (b) comprises:

deriving an error signal representative of a phase difference between the IF carrier component and a feedback signal;

filtering the error signal to thereby produce a filtered error signal;

generating a Voltage Controlled Oscillator (VCO) output signal responsive to the filtered error signal; and

deriving the feedback signal and the second LO signal from the VCO output signal.

16. The method of claim 15, further comprising deriving the first LO signal from the VCO output signal, whereby the first LO signal is phase-locked to the IF carrier component.

17. The method of claim 12, further comprising:

filtering the baseband signal to thereby produce a filtered baseband signal including the demodulated sideband; and

deriving a logic signal representative of information conveyed by the demodulated sideband.

18. The method of claim 17, further comprising:

generating a re-synchronizing clock from a local clock; and

synchronizing the logic signal to the re-synchronizing clock to thereby produce a re-synchronized logic signal having reduced timing jitter relative to the logic signal.

19. The method of claim 18, wherein the demodulated sideband has a frequency bandwidth defined between a lower sideband frequency and an upper sideband frequency, the lower sideband frequency being frequency-offset from zero Hz and the upper sideband frequency being less than 50 Hz.

20. The method of claim 19, wherein said filtering step includes bandpass filtering the baseband signal to

pass the demodulated sideband to the deriving step with relatively little attenuation of the demodulated sideband,

substantially attenuate frequencies at or near zero Hz, and

substantially attenuate frequencies equal to and above 50 Hz.

21. A method, comprising:

(a) receiving a magnetic field signal including

a magnetic field signal carrier component usable for locating an underground object and having a carrier frequency substantially equal to an integer multiple of 300 Hz, and

a magnetic field signal modulation sideband including magnetic field signal sideband energy, a substantial portion of the magnetic field signal sideband energy being contained between the carrier frequency and a frequency spaced 50 Hz away from the carrier frequency; and

(b) recovering information conveyed by the modulation sideband.

22. The method of claim 21, wherein step (b) comprises demodulating the modulation sideband to recover the information conveyed thereby.